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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/623,319	07/19/2003	Luiz M. Franca-Neto	1000-0007	3275

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EXAMINER

VIGUSHIN, JOHN B

ART UNIT PAPER NUMBER

2841

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/623,319

Applicant(s)

FRANCA-NETO ET AL.

Examiner

John B. Vigushin

Art Unit

2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17, 19-35 and 40-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3, 6, 8, 10-17, 19-35 and 40-43 is/are allowed.
- 6) ☒ Claim(s) 1 and 9 is/are rejected.
- 7) ☒ Claim(s) 2, 4, 5 and 7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. The present Office Action is responsive to Applicant's amended response filed February 22, 2005 (Certificate of Mailing date: February 16, 2005). The Examiner acknowledges the amendments to Claims 3, 6, 8, 10, 17, 23, 25, 28, 33 and 40, and the cancellation of Claims 18 and 36-39. Accordingly, Claims 1-17, 19-35 and 40-43 remain pending in the instant amended Application.

### **Rejections Based On Prior Art**

2. The following references were relied upon for the rejections hereinbelow:

Haub et al. (US 5,861,853)

Yamada et al. (US 6,570,469 B2)

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Haub et al.

Haub et al. discloses, in Fig. 4: an antenna interface circuit (defined by balun networks 430 and 450) to provide an interface between a packaged microelectronic device 440 and an antenna 460, comprising: a metallization on substrate 420, the metallization forming a power amplifier impedance transformer defined by balun networks 430 and 450; and at least one electrical terminal (i.e., at least one electrical

Art Unit: 2841

terminal interconnecting the microelectric device to the traces connected to the balun 430) to couple the antenna interface circuit (balun 430) to a microelectronic device package 440 (col.2: 66-col.3: 12; col.4: 30-35).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haub et al. in view of Yamada et al.

I. Haub et al. does not specify the type of electrical terminal that couples antenna interface circuit 430 to microelectronic package 440 (Fig. 4).

II. Yamada et al., like Haub et al., is in the art of packaging high frequency wireless devices (col.1: 11-14) and discloses that mounting IC chips 4 by bump connection techniques result in reduced parasitic impedances and excellent frequency characteristics due to the very small parasitic impedances (inductances and capacitances) (Fig. 2; col.14: 50-53).

III. Since both Haub et al. and Yamada et al. are both in the same high frequency electronic packaging art, the use of a bump connection technique--such as Ball Grid Array (BGA)--for mounting an IC microelectronic device chip to the substrate in order to reduce parasitic impedances and ensure stable and reliable chip performance over all the operational frequencies, as taught in Yamada et al., would have been readily recognized in the package of Haub et al., wherein the problems of impedance matching between chip and amplifier, and between amplifier and antenna, are solved by power amplifier impedance transformers (baluns) that depend on stable I/O resistances in the chip, amplifier and antenna in order to optimize the impedance matching function of the baluns.

IV. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Haub et al. such that the at least one terminal coupling the antenna interface circuit (balun) to microelectronic device package (IC chip) includes a BGA in order to reduce parasitic impedances and enhance the reliability of signal transmission over all operational frequencies between the microelectronic device package and the antenna interface circuit, as taught by Yamada

Art Unit: 2841

et al., thereby optimizing the impedance matching function of the antenna interface circuit in the package of Haub et al.

***Allowable Subject Matter***

8. Independent Claims 3, 6, 8 and 10, Claim set 11-16, Claim set 17, 19-22, 24, 26 and 27; independent Claims 23, 25 and 28; Claim set 29-32; Claim set 33-35 and 40; and Claim set 41-43 have been allowed.

9. Claims 2, 4, 5 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

10. Applicant's arguments, see pp.11-13 of the instant Amendment, filed February 22, 2005, with respect to amended independent Claims 17 and 33, have been fully considered and are persuasive. The rejections of amended Claims 17 and 33, and the claims dependent therefrom, have been withdrawn. Similarly, Applicant's arguments on pp.15-16 and 16-17 of the instant Amendment with respect to dependents Claim 19 and 40, respectively, have been fully considered and are persuasive, and the rejection of dependent Claims 19 and 40 have been withdrawn for those reasons and for their dependency from now allowed base Claims 17 and 33, respectively.

11. Applicant's arguments on pp.14-15 of the instant Amendment with respect to Claim set 1, 2, 4, 5, 7 and 9, as originally filed, have been considered but are moot in

Art Unit: 2841

view of the new ground(s) of rejection over Haub et al. (Claim 1) and Haub et al. in view of Yamada et al. (Claim 9). Accordingly, the present Office Action is made NON-FINAL.

### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Beard et al. (US 2002/0171591 A1) discloses, in Fig. 10, an integrated circuit package 10 mounted on a circuit board 200 using solder balls 40. A flexible antenna is mounted to an upper surface of the integrated circuit package 10 (paragraph [0043]).

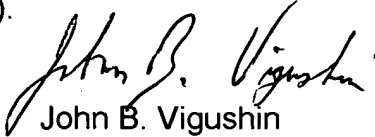
Epstein et al. (US 6,774,847 B1) discloses a chip antenna 20 coupled to a transmitter and/or receiver subsystem 44, e.g. wireless transmitter (col.4: 41-42), through a connection to a flexible interface circuit 30 (Figs. 4 and 5; col.6: 17-28).

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John B. Vigushin whose telephone number is 571-272-1936. The examiner can normally be reached on 8:30AM-5:00PM Mo-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2841

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
John B. Vigushin  
Primary Examiner  
Art Unit 2841

jbv  
May 11, 2005